Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended) A materialization method of a photo detect device, wherein channels for transferring carriers are set by heterointerfaces and impurity doping and magnitude of currents which flow through the channels is determined by controlling Fermi level, comprising the steps of:

forming at least one quantum dot layer which includes a plurality of quantum dots at predetermined positions proximate to the channels not only for carriers in the quantum dots to be released in response to incident ~~lights~~ light and accumulated in the channels but also for carriers in a contact layer to be drawn to the channels until the vacancy of the quantum dots, which is originated by release of carriers, is refilled by other carriers wherein the electron-flow through the quantum dot layer is blocked by the quantum dots formed in the quantum dots layer; and

providing the Fermi level at an activation position by confining the carriers within the quantum dot layers while limiting the number of the carriers in the channels for the purpose of minimizing a current flow in the absence of incident light.

Claim 2 (original) A materialization method as set forth in claim 1, wherein the light is infrared light ranging, in wavelength, from 0.77 μm to 100 μm.

Claim 3 (currently amended) A photo detect device, wherein channels for transferring carriers are set by heterointerfaces and impurity doping, comprising:

at least one quantum dot layer containing a plurality of quantum dots located at predetermined positions proximate to the channels in at least one conduction path layer for the carriers in the quantum dots to be released in response to incident ~~lights~~ light and accumulated in the channels and to influence the potential of the channels in such a manner that carriers be drawn to the channels from a contact layer;

at least one light absorption layer containing the at least one quantum dot layer, which is formed by alternating the quantum dot layer and a material different in band gap from the quantum dot layer;

the at least one conduction path layer, in which carriers excited in the light absorption layers are collected and conducted in a horizontal direction which is parallel to the at least one conduction path layer;

at least two detect electrodes for conducting in the horizontal direction the carriers which are accumulated in the

channels in response to the light incident on the at least one light absorption layer, the two electrodes are formed at respective end portions of the quantum dot layer, wherein the electron-flow through the quantum dot layer is blocked by the quantum dots formed in the quantum dots layer; and

the contact layer on which the detect electrodes are formed to collect and to provide the carriers for the quantum dots.

Claim 4 (original) A photo detect device as set forth in claim 3, wherein the at least two detect electrodes have a distance therebetween which is longer than the wavelength of the incident light in the device.

Claim 5 (currently amended) A photo detect device as set forth in claim 3, further comprising at least one impurity-containing layer, wherein the distribution of ~~the~~ impurities in the at least one impurity-containing layer take a shape of a delta function.

Claim 6 (currently amended) A photo detect device as set forth in claim ~~3~~ 5, wherein the at least one impurity-containing layer have a uniform distribution of the impurities therethrough and are etched to control the number of carriers provided to the quantum dots.

Claim 7 (currently amended) A photo detect device as set forth in claim ~~3~~ 5, wherein the at least one impurity-containing layer and the at least one light absorption layer are formed adjacent to the at least one conduction path layer.

Claim 8 (currently amended) A photo detect device as set forth in claim ~~3~~ 5, wherein the at least one impurity-containing layer and the at least one light absorption layer are formed to be overlapped with the at least one conduction path layer.

Claim 9 (currently amended) A photo detect device as set forth in claim ~~3~~ 5, wherein the at least one impurity-containing layer, the at least one conducting path layer and the at least one light absorption layer are made to have different band gaps so as to be subjected to heterostructures.

Claim 10 (currently amended) A photo detect device as set forth in claim ~~3~~ 5, further comprising at least one control electrode for controlling the amount of the carriers provided to the at least one light absorption layer and the at least one conduction path layer.

Claim 11 (previously presented) A photo detect device as set forth claim in 10, wherein impurities which are opposite, in type, to those in the at least one impurity-containing layer are doped

below a bottom layer of the at least one control electrode, to reduce leak currents of the at least one control electrode.

Claim 12 (previously presented) A photo detect device as set forth claim in 10, wherein a highly resistant layer is provided below a bottom layer of the at least one control electrode to reduce leak currents of the at least one control electrode.

Claim 13 (original) A photo detect device as set forth in claim 10, wherein at least two control electrodes are used and provided sequentially with electric fields different in magnitude, so as to detect the carriers accumulated in the channels beneath the at least two control electrodes, in sequence.

Claim 14 (original) A photo detect device as set forth in claim 13, wherein impurities which are opposite, in type, to those in the at least one impurity-containing layer are doped below a bottom layer of the at least two control electrodes, to reduce leak currents of the at least two control electrodes.

Claim 15 (previously presented) A photo detect device as set forth in claim 13, wherein a highly resistant layer is provided below a bottom layer of the at least two control electrodes to reduce leak currents of the at least two control electrodes.

Claim 16 (original) A photo detect device as set forth in claim 13, wherein the at least two control electrodes are formed into at least two layers lest the control electrode in one layer may overlap with that in another layer, a matter with a large resistance is interposed between the at least two control electrode layers, and electric fields different in magnitude are subsequently applied to the at least two control electrodes, whereby the charges accumulated in the channels beneath the at least two control electrodes can be, in sequence, detected.

Claim 17 (previously presented) A photo detect device as set forth in claim 16, wherein impurities which are opposite, in type, to those in the at least one impurity-containing layer are doped below a bottom layer of the at least two control electrodes, to reduce leak currents of the at least two control electrodes.

Claim 18 (original) A photo detect device as set forth in claim 16, wherein a highly resistant layer is provided below a bottom layer of the at least two control electrodes to reduce leak currents of the at least two control electrodes.

Claim 19 (currently amended) A method for fabricating photo detect device, comprising the steps of:

growing light absorption layers in such a way that quantum dots are naturally formed in the course, wherein said absorption

layers contain a plurality of quantum dots and are located at predetermined positions proximate to channels not only for carriers in the quantum dots to be released from the quantum dots in response to incident ~~lights~~ light and accumulated in the channels but also for carriers in a contact layer to be drawn to the channels;

depositing at least two electrodes on ~~a~~ the contact layer to show horizontal conduction, the two electrodes are formed at respective end portions of the quantum dot layer, wherein the electron-flow through the quantum dot layer is blocked by the quantum dots formed in the quantum dots layer;

reducing the resistance between the ~~electrode~~ electrodes and the contact layer;

etching the edge of the device to an extent necessary to reduce an electrical connection to other neighboring devices;

etching the contact layer and/or a carrier supplying layer to a depth necessary to control the amount of carriers provided to the quantum dots;

depositing at least one control electrode for controlling carriers provided to the quantum dots;

depositing an insulating film to prevent a short circuit from being formed between the electrodes; and

etching a predetermined portion of the insulating film to transfer desired signals.